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Crops Research Division

AN EVALUATION OF SEVERAL CHEMICALS FOR THEIR HERBICIDAL PROPERTIES
1961 Field Results

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Plant Industry Station
Beltsville, Maryland
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Preliminary Data Not For Publication

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Source and Index of Chemicals Included in This Report

Chemical *	Designation	Company Code	Source **	Table numbers ***
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α-carbo-(2,4-dichlorophenoxyethoxy)ethyl N-(3-chlorophenyl)carbamate	-	BP-4	CSC	2, 28, 29, 30
ethyl-di-n-butylthiolcarbamate	-	R-1870	STF 13/	32
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n-cyclooctyl dimethylurea + butynyl N-(3-chlorophenyl)carbamate	-	HS-55	BAD	16, 28, 29, 30
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1-[5-(3a,4,5,6,7,7a-hexahydro-4,7-methanoindanyl)]-3,3-dimethylurea	-	7531	HPC 9/	18, 28, 29, 30
3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea	-	326	EID 6/	31
3-(3,4-dichlorophenyl)-1,1-dimethylurea	diuron	-	EID	33
N,N-dimethyl-2,2-diphenylacetamide, formulated	-	L-34314	ELI 7/	31
N,N-dimethyl-2,2-diphenylacetamide, technical	-	U 4513	UPJ 14/	32
N,N-di-n-propyl-2,6-dinitroanaline	-	L-31864	ELI	32
N,N-di - n-propyl - 2,6-dinitro-p-toluidine	-	L-35455	ELI	31
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methyl-o-nitrophenylsulfide	-	MCC 13936	MCC 10/	32
N-(2-chloro-4-nitrophenyl)-methane sulfonamide	-	N-2547	STF	23, 28, 29, 30
1,2-dihydropyridazine-3,6-dione (maleic hydrazide)	MH	-	NUS 12/	33
3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione	-	B-792	NUS	24, 28, 29, 30

Chemical *	Designation	Company Code	Source **	Table numbers ***
tributyl isooctenylphosphonium chloride	-	V-C 1-641	VCC 15/	31
2,6-dichlorobenzonitrile	-	5996	NFM	33
4,6-dinitro-o-sec-butylphenol, alkanolamine salts	DNBP	-	DCC 5/	25, 28, 29, 30, 33
4,6-dinitro-2-sec-butylphenol acetate	-	5778	NFM	31
2,4-dichlorophenoxyacetic acid, alkanolamine salts	2,4-D	-	DCC	26, 28, 29, 30, 33
N-(beta-O,O-diethyl dithiophosphorylethyl) benzene sulfonamide	-	R-3415	STF	27, 28, 29, 30

* Nomenclature based on Weed Society of America Terminology Committee Report.

** Source

Abbreviation		Source of Chemicals	Contact
1/	ANS	Ansul Chemical Company, Marinette, Wisconsin	R. E. Thompson
2/	BAD	Badische Anilin- & Soda-Fabrik AG., Ludwigshafen am Rhein, Germany (and) BASF, Inc., New York 22, New York	H. C. Lehmann
3/	BAY	Farbenfabriken Bayer AG., Germany (and) Vero Beach Laboratories, Inc., Vero Beach, Florida	W. E. Wagner
4/	CSC	Columbia-Southern Chemical Corporation, Pittsburgh, Pennsylvania	W. C. McConnell
5/	DCC	Dow Chemical Company, Midland, Michigan	L. Southwick
6/	EID	E. I. du Pont de Nemours & Company, Wilmington, Delaware	R. W. Varner
7/	ELI	Eli Lilly and Company, Greenfield, Indiana	E. F. Alder
8/	GCC	Geigy Chemical Corporation, Yonkers, New York	C. R. Hunt
9/	HPC	Hercules Powder Company, Wilmington, Delaware	E. N. Woodbury
10/	MCC	Monsanto Chemical Company, St. Louis, Missouri	L. H. Hannah
11/	NFM	Niagara Chemical Division, Food Machinery & Chemical Corporation, Middleport, New York	B. C. Dickinson
12/	NUS	Naugatuck Chemical, U. S. Rubber Company, Bethany 15, Connecticut	J. A. Riddell
13/	STF	Stauffer Chemical Company, New York, New York	A. B. Lindquist
14/	UPJ	The Upjohn Company, Kalamazoo, Michigan	B. D. Seeley
15/	VCC	Virginia-Carolina Chemical Company, Richmond, Virginia	C. R. Downing

*** Table numbers - Single Rate Plots, 1-27; Summary, 28-30; Logarithmic Plots, 31-33.

AN EVALUATION OF SEVERAL CHEMICALS FOR THEIR HERBICIDAL PROPERTIES

1961 Field Results

W. A. Gentner and L. L. Danielson [1/]

The results of the 1961 preliminary field evaluation studies of several chemicals for their herbicidal properties are presented in this report. These studies were conducted by personnel of the Weed Investigations - Horticultural Crops group, Crops Protection Research Branch, Crops Research Division, at the Plant Industry Station, Beltsville, Maryland.

The objectives of the herbicide evaluation project are (1) to develop herbicide evaluation techniques, (2) to determine the responses of crops and weeds to new chemicals applied as soil-incorporated pre-planting, pre-emergence and post-emergence treatments, (3) to obtain preliminary information on the herbicidal properties of new chemicals, (4) to study the relationships between chemical structure and herbicidal activity, and (5) to make this information available to Department of Agriculture personnel and cooperating state and chemical industry weed research workers.

These field evaluation studies should be interpreted as preliminary and the results analyzed and used accordingly.

MATERIALS AND METHODS

A three year field rotation is used to insure uniform weed populations and to reduce the possibility of confounding results due to residual activity of chemicals in the soil. The areas used for the 1961 field studies were planted to corn in the summer of 1960 and a cover crop mixture of rye and vetch during the fall-spring periods of 1960-1961.

New chemicals accompanied by limited information on their herbicidal properties were evaluated in single rate plots and chemicals on which extensive information was available were evaluated in logarithmic rate plots. The sources of all chemicals used in these studies appear on pages 4 and 5.

Single rate plot studies were conducted on a Codorus silt loam and logarithmic rate plot studies were conducted on a Keyport silt loam. Approximately 400 pounds of a 5-10-5 fertilizer per acre were applied just prior to plowing. Insects were controlled by spraying with a mixture of methoxychlor and malathion as required.

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The herbicidal properties of compounds evaluated in 1961 will be discussed by treatment type under the following categories:

(1) Small-Seeded Legume Crops: alfalfa, birdsfoot trefoil, lespedeza, red clover, white clover.
(2) Cereals and Forage Crops: buckwheat, field and sweet corn, oats, sorghum, Sudangrass.
(3) Oilseed and Fiber Crops: castorbeans, cotton, flax, peanuts, safflower, soybeans.
(4) Sugar Crops: sugarbeets.
(5) Vegetable Crops: cabbage, cowpeas, cucumbers, lima beans, onions, peas, snapbeans, squash, tomatoes, turnips.
(6) Soil Sterilants

Single Rate Plots

Twenty-four crop and four weed species were seeded in the single rate plots and were treated with a conventional tractor-mounted experimental plot sprayer. Large-seeded crops were planted with a tractor-drawn gang-planter at the recommended rate and depth of seeding in two rows spaced 20 inches apart. Small-seeded crops and weeds including alfalfa, birdsfoot trefoil, red clover, white clover, crabgrass, ryegrass, lambsquarters, mustard, and pigweed were broadcast seeded in about 5 foot swaths on the experimental area over compatible crops and were covered by means of a plank-drag. The term grasses in tables 1-27 refers collectively to foxtail species (Setaria spp.), barnyardgrass (Echinochloa crusgalli), and goosegrass (Eleusine indica). The term broadleaved weeds in these tables refers to ragweed (Ambrosia artemisiifolia), smartweed (Polygonum pennsylvanicum), carpetweed (Mollugo verticillata), horsenettle (Solanum carolinense), and purslane (Portulaca oleracea).

The crop plants, weed species, chemical, chemical rates per acre, and time of treatment in the single rate plots are indicated in tables 1-27.

The pre-planting soil-incorporated treatments were applied and disked into the soil on May 25. Test species were planted 14 and 28 days after treatment. Responses of test species planted 28 days after treatment are included in this report. Data were recorded on July 20.

The pre-emergence treatments were applied on May 23, the day after planting. Data were recorded June 21.

The test species used in the post-emergence plots were planted on May 25, treated on June 23, and data were recorded July 18-20.

A list of the common and binomial names, varieties, and heights of the species at time of post-emergence treatments is given on page 15.

All chemicals were formulated in either acetone (A) or water (W) and contained a 1 percent v/v concentration of the surfactant polyoxyethylene sorbitan monolaurate. Sprays were applied at 40 gallons per acre.

All rates of application are given on an acid equivalent basis where applicable. Other rates are given on an active ingredient basis.

Data presented in tables 1-27 represent a combination of the average of three independent injury ratings using the following scale: 0 = no visible effect; 1,2,3 = slight injury, plants usually recovered with little or no reduction in top growth; 4,5,6 = moderate injury, plants usually recovered but with reduced top growth; 7,8,9 = severe injury, plants usually did not recover; 10 = all plants killed; and the average of three independent ratings on the percentage reduction in stand. The numerical value derived from the combination of these criteria makes it possible to use a single herbicide activity index value to show the effect of each chemical rate on each test species. The range of the herbicide activity index value is from 0 to 100. A herbicide activity index value of 0 indicates that the chemical has no effect on the species, while a value of 100 indicates complete kill. The herbicide activity index value is derived as follows:

$$\frac{(\text{Injury rating score} \times 10) + \text{pct red in stand}}{2} = \text{herbicide activity index value}$$

In preparation of the summary tables several arbitrary figures were chosen. An activity index of 30 or less on crops was considered as sufficient tolerance to warrant further evaluation if weed control was achieved. An activity index of 70 or more on weeds was considered as satisfactory weed control. A desirable situation may be described as a chemical, the applications of which brought about an activity index of 30 or less on specific crops and an activity index of 70 or more on weeds.

Logarithmic Plots

The area used for the preliminary evaluation of chemicals applied with the logarithmic sprayer was marked into a series of 4 x 80 ft beds. Each plot consisted of 6 beds with 4 rows of crops 9 inches apart per bed. Birdsfoot trefoil and red clover were overseeded. Crabgrass was a natural weed common to all plots. All crops were seeded at the recommended depth with a tractor-mounted gang-planter on May 18. High seeding rates were used to provide a large population of plants for evaluation at the various rate levels.

Pre-emergence treatments were applied on May 19 and data were recorded on June 15. Post-emergence applications were made on June 20, when the soybeans were 5 inches tall and in the first trifoliate-leaf stage. Post-emergence data were recorded on July 14.

The rates of application of a compound on the logarithmic plots are presented as a rate-range and include an initial high level of application and all rates of application down to and including one-eighth of the high level.

The responses of the test species were determined on an absolute basis, i.e. the maximum rate of chemical application that was tolerated without

visible injury to the crop was recorded. Conversely, for weeds, that rate of chemical application that resulted in complete control of the weed was recorded.

Rainfall and temperature prior to and after preliminary field evaluation studies.

Single Rate Plots

	Total rainfall	Min. av. temp.	Max. av. temp.
	inches	°F.	°F.
Chemicals applied pre-planting and pre-emergence, May 25, 1961			
30 days prior to treatment	3.03	47	70
7 days prior to treatment	.02	44	69
7 days after treatment	.34	43	73
30 days after treatment	3.63	55	81
Chemicals applied post-emergence, June 23, 1961			
30 days prior to treatment	3.63	54	80
7 days prior to treatment	.96	53	76
7 days after treatment	.74	56	79
30 days after treatment	2.23	60	84

Logarithmic Plots

	Total rainfall	Min. av. temp.	Max. av. temp.
	inches	°F.	°F.
Chemicals applied pre-emergence, May 19, 1961			
30 days prior to treatment	3.01	46	69
7 days prior to treatment	.71	54	73
7 days after treatment	----	45	71
30 days after treatment	2.67	52	79
Chemicals applied post-emergence, June 20, 1961			
30 days prior to treatment	2.67	52	79
7 days prior to treatment	.94	54	81
7 days after treatment	1.62	60	79
30 days after treatment	3.19	60	83

RESULTS AND DISCUSSION

The data reported herein are preliminary and are an expression of plant responses to chemicals applied as soil-incorporated pre-planting, pre-emergence, and post-emergence treatments under the environmental conditions of these experiments. These data are to be interpreted as indicative and not conclusive and are therefore presented as a guide in the use and development of the prospective herbicides listed.

Single Rate Plots

Test plant responses to each chemical evaluated for its herbicidal properties are presented on a single page as herbicide activity index values. Such arrangement permits a ready comparison of pre- and post-emergence treatments and allows investigators to select chemicals for application following clean cultivation at lay-by. Summary tables are presented as tables 28, 29, and 30.

Small-Seeded Legume Crops

Pre-emergence control of one or more of the broadleaved weeds and weed-grasses was achieved by 2-ethoxyethylamino-4-isopropylamino-6-methoxy-s-triazine (table 12) and N-(2-chloro-4-nitrophenyl)-methane sulfonamide (table 23). Broadleaved weeds were controlled by treatment with 2-(3,4-dichlorobenzylmercapto)-4,6-dimethyl pyrimidine (table 9). The 2-isopropylamino-4-methoxyethylamino-6-methylmercapto-s-triazine (table 14) was effective in controlling weed-grasses in one or more of the small-seeded legumes as a pre-emergence treatment (Summary Table 29).

The post-emergence treatment of silver methane arsonate (table 21) effectively controlled both weed-grasses and broadleaved weeds in alfalfa (Summary Table 30).

Cereals and Forage Crops

Numerous chemicals were effective in controlling weed-grasses and broadleaved weeds in cereals and forage crops as pre- and/or post-emergence treatments.

Corn showed considerable tolerance to many of the new compounds included in this study when they were applied and soil-incorporated 4 weeks prior to planting (Summary Table 28).

Control of weed-grasses and broadleaved weeds was achieved in one or more of the cereals and/or forage crops by pre-emergence treatments with the following compounds or groups:

(1) isopropyl N-(3-chlorophenyl)carbamate [CIPC], (table 3)
(2) several s-triazines, (tables 10, 11, 12, 14)
(3) N-(p-chlorophenyl)-O-N',N'-trimethylisourea, (table 17)
(4) acetate of phenylcarbamate of dimethylaminomethyl-2-naphthol, (table 19)
(5) N-(2-chloro-4-nitrophenyl)-methane sulfonamide, (table 23)
(6) 3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione, (table 24)
(7) alkanolamine salts of 4,6-dinitro-o-sec-butylphenol [DNBP] and 2,4-dichlorophenoxyacetic acid [2,4-D], (tables 25, 26)

Broadleaved weeds but not weed-grasses were controlled by pre-emergence treatments in one or more of the cereal and fiber crops by 2,4-dichlorophenoxyethyl N-phenylcarbamate (table 6), 2-(4-chlorobenzylmercapto)-4,6-dimethyl pyrimidine (table 8), and 2-(3,4-dichlorobenzylmercapto)-4,6-dimethyl pyrimidine (table 9). Post-emergence treatments with a number of compounds were effective in controlling broadleaved weeds and/or weed-grasses in one or more of the cereal and forage crop group (Summary Table 30).

Oilseed and Fiber Crops

Cotton showed a high tolerance to the pre-planting soil-incorporated treatments of many chemicals included in these studies (Summary Table 28).

A variety of chemicals appear promising for pre-emergence broadleaved weed and weed-grass control in one or more of the oilseed and fiber crops. Further study is needed on several carbamates and s-triazines as well as N-(p-chlorophenyl)-O-N',N'-trimethylisourea (table 17), acetate of phenylcarbamate of dimethylaminomethyl-2-naphthol (table 19), N-(2-chloro-4-nitrophenyl)-methane sulfonamide (table 23), and 3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione (table 24) (Summary Table 29).

Post-emergence treatments of propynyl N-(3-chlorophenyl)carbamate (table 5) and N-(2-chloro-4-nitrophenyl)-methane sulfonamide (table 23) appear promising for weed control in peanuts. The α-carbo-(2,4-dichlorophenoxyethoxy)ethyl N-phenylcarbamate appears promising for broadleaved weed control in flax (table 1) (Summary Table 30).

Sugar Crops

Pre-emergence control of both broadleaved weeds and weed-grasses in sugar beets, the only sugar crop in these studies, resulted from application of propynyl N-phenylcarbamate (table 4), n-cyclooctyl dimethylurea plus butynyl N-(3-chlorophenyl)carbamate (table 16), and 3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione (table 24). The 2-(3,4-dichlorobenzylmercapto)-4,6-dimethyl pyrimidine controlled only broadleaved weeds in sugar beets (table 9) (Summary Table 29).

No post-emergence treatment was considered satisfactory (Summary Table 30).

Vegetable Crops

Cucumbers, the only vegetable crop included in the pre-planting soil-incorporated phase of these studies, tolerated a large number of compounds. Summary Table 28 indicates these results.

Many of the chemicals included in this study were tolerated by one or more of the vegetable crops in one or more methods of application and resulted in the control of broadleaved weeds and/or weed-grasses (Summary Table 29).

Cabbage and lima beans were the only vegetable crops which tolerated post-emergence application of the chemicals included in these studies. Cabbage tolerated 3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione (table 24) which resulted in satisfactory control of broadleaved weeds. The post-emergence application of propynyl N-(3-chlorophenyl)carbamate (table 5) resulted in the control of broadleaved weeds and weed-grasses in cabbage.

Broadleaved weeds were satisfactorily controlled in lima beans by post-emergence applications of N-(2-chloro-4-nitrophenyl)-methane sulfonamide (table 23) (Summary Table 30).

Soil Sterilants

Sufficient general herbicidal activity was possessed by pre- and post-emergence treatments of n-cyclooctyl dimethylurea (table 15) and 1-[5-(3a, 4,5,6,7,7a-hexahydro-4,7-methanoindanyl)]-3,3-dimethylurea (table 18) to suggest their evaluation as soil sterilants.

Logarithmic Plots

It was reported in 1959 and in 1960 that the logarithmic method of applying chemicals shows excellent promise for the evaluation of their herbicidal properties. More area is required in the utilization of the logarithmic sprayer than for single rate plots when the same number of crops are used as test species. More data are derived from logarithmic plots than are derived from single rate plots. The rate-ranges of crop tolerances and weed susceptibilities are clearly defined providing investigators sufficient information to more adequately conduct variety trials or quality and yield studies. It must be emphasized that data presented in tables 31, 32, and 33 are in summary form and are presented on an absolute basis (see page 8).

Pre-emergence Studies:

Small-Seeded Legumes

The N,N-dimethyl-2,2-diphenylacetamide appeared quite promising for the control of pigweed and ryegrass in alfalfa when applied as a pre-emergence treatment (table 31).

Cereals and Forage Crops

The following chemicals appear promising for weed control in one or more of the cereal or forage crops as pre-emergence treatments.

(1) 3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea (table 31)
(2) methyl N-(3,4-dichlorophenyl)carbamate (table 31)
(3) 4,6-dinitro-2-sec-butylphenol acetate (table 31)
(4) N,N-dimethyl-2,2-diphenylacetamide (table 31)
(5) 2,6-dinitro-N,N-di-n-propyl-α,α,α-trifluoro-p-toluidine (table 31)
(6) 2,4-bis(isopropylamino)-6-methylmercapto-s-triazine (table 32)

Oilseed and Fiber Crops

Broadleaved weeds and weed-grasses were controlled in a number of oilseed and fiber crops by the following chemicals.

(1) methyl N-(3,4-dichlorophenyl)carbamate (table 31)
(2) 4,6-dinitro-2-sec-butylphenol acetate (table 31)
(3) N,N-dimethyl-2,2-diphenylacetamide (table 31)
(4) 2,6-dinitro-N,N-di-n-propyl-α,α,α-trifluoro-p-toluidine (table 31)
(5) 2,4-bis(isopropylamino)-6-methylmercapto-s-triazine (table 32)

Sugar Crops

The pre-emergence application of N,N-dimethyl-2,2-diphenylacetamide appears promising for broadleaved weeds and weed-grass control in sugar beets (table 31).

Vegetable Crops

One or more of the vegetable crops were tolerant of the pre-emergence application of several of the chemicals included in this study. Among the chemicals that appear promising in this crop group are the following:

(1) 3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea (table 31)
(2) methyl N-(3,4-dichlorophenyl)carbamate (table 31)
(3) 4,6-dinitro-2-sec-butylphenol acetate (table 31)
(4) N,N-dimethyl-2,2-diphenylacetamide (table 31)
(5) 2,6-dinitro-N,N-di-n-propyl-α,α,α-trifluoro-p-toluidine (table 31)
(6) 2,4-bis(isopropylamino)-6-methylmercapto-s-triazine (table 32)

Post-emergence Studies:

Post-emergence treatments either did not result in weed control or did considerable damage to the crops. The possibility of utilizing the combined pre- and post-emergence data in the selection of chemicals for application following clean cultivation at lay-by is worthy of mention. By use of granular carriers damage to growing crops may be eliminated or otherwise greatly reduced.

Residual Activity of Herbicides

The experimental areas used for the preliminary single rate and logarithmic plots were plowed to a depth of 6-8 inches on September 12. A seed bed was prepared by thorough disking to a depth of 4 inches and a cover crop of rye and vetch was seeded on September 18.

The experimental areas were evaluated on November 3 and two chemicals were determined to be residual in the post-emergence logarithmic plots. The N,N-dimethyl-2,2-diphenylacetamide resulted in residual herbicidal action from 1 to 8 pounds per acre. The 2-methoxy-4,6-bis(3-methoxypropylamino)-s-triazine was active in a range of from 2 to 4 pounds per acre.

SUMMARY

The responses of 24 test crops and 4 weeds to 27 chemicals applied in single rate plots as pre-planting soil-incorporated, pre-emergence and/or post-emergence treatments are recorded in tables 1-27 and are summarized in tables 28-30 by crops, weeds, and chemicals.

In the single rate plot summary, an "X" indicates that a phytotoxicity index was 30 or less for crops and 70 or more for weeds. Reference is made in the summary table to the specific tables of individual data.

The logarithmic sprayer was used in the preliminary evaluation of 22 chemicals applied as pre-emergence and post-emergence treatments. Logarithmic plot data are presented in tables 31-33.

Species and Varietal Names of Crops and Weeds

	Common Name	Scientific Name	Variety	Height of test species in inches at time of post-emergence treatment
1.	Alfalfa	Medicago sativa	Buffalo	7
2.	Birdsfoot trefoil	Lotus corniculatus	Italian	3
3.	Buckwheat	Fagopyrum esculentum	-----	21
4.	Cabbage	Brassica oleracea v. capitata	Late Flat Dutch	3
5.	Castorbeans	Ricinus communis	Cimarron	6
6.	Corn, Field	Zea mays	US 13	11
7.	Corn, Sweet	Zea mays v. rugosa	Iochief	8
8.	Cotton	Gossypium hirsutum	Coker 100 WR	4
9.	Cowpeas	Vigna sinensis	Mixed	5
10.	Cucumbers	Cucumis sativus	Marketer	4
11.	Flax	Linium usitatissimum	Cascade	7
12.	Lespedeza	Lespedeza stipulaceae	Korean	2
13.	Lima beans	Phaseolus limensis	Fordhook 242	6
14.	Oats	Avena sativa	Clinton 59	13
15.	Onions	Allium sativum	Evergreen Bunching	delayed pre-emergence
16.	Peanuts	Arachis hypogae	Spanish	3
17.	Peas	Leguminosae sativum subsp. hortense	Laxton Progress	11
18.	Red clover	Trifolium pratense	Kenland	3
19.	Safflower	Carthamus tinctorius	Pacific 2	8
20.	Snapbeans	Phaseolus vulgaris	Top Crop	7
21.	Sorghum	Sorghum vulgare	Milo	7
22.	Soybeans	Soja max	Lee	5
23.	Squash	Cucurbita pepo	Early Summer Crookneck	10
24.	Sudan grass	Sorghum vulgare sudanese	Sweet 372	7
25.	Sugar beets	Beta vulgaris	SP 55600-01	4
26.	Tomatoes	Lycopersicon esculentum v. commune	Rutgers	4
27.	Turnips	Brassica campestris v. rapa	Purple Top White Globe	5
28.	White clover	Trifolium repens ladino	Pilgrim	2
29.	Crabgrass	Digitaria sanguinalis	-----	3
30.	Ryegrass	Lolium multiflorum	Annual Italian	6
31.	Pigweed	Amaranthus retroflexus	-----	3
32.	Rape	Brassica napus	-----	10

Table 1. Single Rate Plot Results, Tables 1-27.

Chemical	α-carbo-(2,4-dichlorophenoxyethoxy)ethyl N-phenylcarbamate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			90	95	90	95
B-ft trefoil			95	100	80	90
Buckwheat			20	40	40	70
Cabbage			95	100	95	100
Castorbeans			30	70	60	90
Corn	0	0	0	10	70	90
Cotton	0	0	95	95	70	95
Cowpeas			50	70	70	90
Cucumber	0	10	90	100	70	95
Flax			50	70	30	50
Lespedeza			95	95	50	80
Lima beans			40	50	40	60
Oats			80	90	90	95
Peanuts			30	50	40	50
Peas			30	60	40	60
Red clover			95	100	80	90
Safflower			40	60	60	80
Snapbeans			40	60	50	70
Sorghum			40	70	30	50
Soybeans	0	0	40	60	60	80
Squash			80	95	70	90
Sudan grass			40	70	20	40
Sugar beets			95	100	90	95
White clover			95	100	90	95
Crop Tox. Av.	0	3	61	75	62	79
Weeds						
Crabgrass			60	80	10	20
Ryegrass			40	80	20	30
Other grasses			60	80	30	50
Pigweed			95	100	40	70
Rape			95	100	90	95
Other brdlf.			90	.95	40	60
Weed Tox. Av.			73	89	38	53
Total Tox. Av.	0	3	63	78	57	74

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 2. Single Rate Plot Results

Chemical	α-carbo-(2,4-dichlorophenoxyethoxy)ethyl N-(3-chlorophenyl)carbamate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			90	95	90	95
B-ft trefoil			90	95	95	100
Buckwheat			40	70	60	90
Cabbage			95	100	95	100
Castorbeans			40	60	70	90
Corn	0	0	10	20	50	70
Cotton	0	10	95	95	90	95
Cowpeas			60	80	70	90
Cucumber	10	20	95	100	40	70
Flax			50	70	50	70
Lespedeza			95	100	60	90
Lima beans			30	50	40	50
Oats			60	80	20	50
Peanuts			30	60	40	60
Peas			40	70	60	80
Red clover			90	95	95	100
Safflower			50	70	40	60
Snapbeans			40	70	50	70
Sorghum			40	60	30	50
Soybeans	0	0	50	70	50	80
Squash			60	80	60	95
Sudan grass			50	70	30	50
Sugar beets			100	100	90	95
White clover			90	95	95	100
Crop Tox. Av.	3	8	62	77	61	79
Weeds						
Crabgrass			60	80	10	40
Ryegrass			20	40	10	40
Other grasses			60	80	10	20
Pigweed			95	100	60	90
Rape			90	95	90	95
Other brdlf.			90	95	40	70
Weed Tox. Av.			62	82	37	59
Total Tox. Av.	3	8	64	78	56	75

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 3. Single Rate Plot Results

Chemical	isopropyl N-(3-chlorophenyl)carbamate [CIPC]					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa			50	90	60	90
B-ft trefoil			80	100	90	95
Buckwheat			100	100	60	80
Cabbage			80	100	50	70
Castorbeans			20	50	40	70
Corn	10	50	20	50	50	70
Cotton	0	0	90	95	40	70
Cowpeas			20	50	60	80
Cucumber	40	90	100	100	60	90
Flax			100	100	50	80
Lespedeza			100	100	80	95
Lima beans			10	30	30	50
Oats			90	95	60	90
Peanuts			10	30	40	70
Peas			10	40	50	70
Red clover			80	100	90	95
Safflower			20	60	30	50
Snapbeans			20	50	50	70
Sorghum			10	40	40	60
Soybeans	0	0	20	50	50	80
Squash			50	90	40	70
Sudan grass			30	60	30	50
Sugar beets			80	95	40	70
White clover			80	100	70	90
Crop Tox. Av.	13	35	53	74	53	75
Weeds						
Crabgrass			95	100	60	80
Ryegrass			95	100	80	95
Other grasses			95	100	20	40
Pigweed			90	95	80	90
Rape			70	95	50	80
Other brdlf.			80	95	80	90
Weed Tox. Av.			88	98	62	79
Total Tox. Av.	13	35	60	79	54	76

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 4. Single Rate Plot Results

Chemical	propynyl N-phenylcarbamate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			0	0		
B-ft trefoil			0	0		
Buckwheat			45	95		
Cabbage			0	0		
Castorbeans			0	0		
Corn	0	0	0	0		
Cotton	0	0	0	0		
Cowpeas			0	0		
Cucumber	0	0	0	0		
Flax			0	0		
Lespedeza			0	0		
Lima beans			0	0		
Oats			0	0		
Peanuts			0	0		
Peas			0	0		
Red clover			0	0		
Safflower			0	0		
Snapbeans			0	0		
Sorghum			0	0		
Soybeans	0	0	0	0		
Squash			30	70		
Sudan grass			0	0		
Sugar beets			0	0		
White clover			0	0		
Crop Tox. Av.	0	0	3	7		
Weeds						
Crabgrass			0	0		
Ryegrass			0	0		
Other grasses			0	0		
Pigweed			0	0		
Rape			0	0		
Other brdlf.			0	0		
Weed Tox. Av.			0	0		
Total Tox. Av.	0	0	3	6		

Relatively Inactive (4A)

Relatively Inactive (8A)

Relatively Inactive (Weeds 4A)

Relatively Inactive (Weeds 8A)

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 5. Single Rate Plot Results

Chemical	propynyl N-(3-chlorophenyl)carbamate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A 1/	4A	8A	4A	8A	4A	8A
Crops 2/						
Alfalfa			20	60	90	95
B-ft trefoil			80	95	90	95
Buckwheat			95	100	90	95
Cabbage			0	20	30	60
Castorbeans			10	20	30	60
Corn	0	0	20	40	10	20
Cotton	0	0	0	20	70	95
Cowpeas			20	30	90	95
Cucumber	0	0	10	30	70	95
Flax			60	80	90	95
Lespedeza			20	70	90	95
Lima beans			10	30	50	90
Oats			50	90	40	70
Peanuts			0	0	20	40
Peas			0	0	90	95
Red clover			80	95	90	95
Safflower			20	50	90	95
Snapbeans			10	30	70	90
Sorghum			0	20	50	70
Soybeans	0	0	10	30	50	70
Squash			20	40	60	100
Sudan grass			30	50	40	60
Sugar beets			60	90	50	70
White clover			90	100	90	95
Crop Tox. Av.	0	0	30	50	64	81
Weeds						
Crabgrass			10	50	30	60
Ryegrass			20	60	80	95
Other grasses			10	50	10	20
Pigweed			10	50	60	95
Rape			0	10	20	50
Other brdlf.			10	50	90	95
Weed Tox. Av.			10	45	48	69
Total Tox. Av.	0	0	26	49	61	79

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 6. Single Rate Plot Results

Chemical	2,4-dichlorophenoxyethyl N-phenylcarbamate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			50	70		
B-ft trefoil			95	95		
Buckwheat			10	30		
Cabbage			20	60		
Castorbeans			20	40		
Corn	0	0	30	50		
Cotton	0	0	100	100		
Cowpeas			50	70		
Cucumber	0	0	20	60		
Flax			30	70		
Lespedeza			60	95		
Lima beans			30	40		
Oats			30	50		
Peanuts			40	90		
Peas			20	40		
Red clover			95	95		
Safflower			20	40		
Snapbeans			30	50		
Sorghum			10	20		
Soybeans	0	0	10	20		
Squash			70	90		
Sudan grass			20	40		
Sugar beets			90	95		
White clover			100	100		
					Relatively Inactive	Relatively Inactive
Crop Tox. Av.	0	0	44	63		
Weeds						
Crabgrass			10	20		
Ryegrass			10	20		
Other grasses			10	20		
Pigweed			70	90		
Rape			30	60		
Other brdlf.			30	60		
					Relatively Inactive	Relatively Inactive
Weed Tox. Av.			27	45		
Total Tox. Av.	0	0	43	59		

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 7. Single Rate Plot Results

Chemical	2-benzylmercapto-4,6-dimethyl pyrimidine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa	Inactive	Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive
B-ft trefoil						
Buckwheat						
Cabbage						
Castorbeans						
Corn						
Cotton						
Cowpeas						
Cucumber						
Flax						
Lespedeza						
Lima beans						
Oats						
Peanuts						
Peas						
Red clover						
Safflower						
Snapbeans						
Sorghum						
Soybeans						
Squash						
Sudan grass						
Sugar beets						
White clover						
Crop Tox. Av.						
Weeds						
Crabgrass	Inactive	Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive
Ryegrass						
Other grasses						
Pigweed						
Rape						
Other brdlf.						
Weed Tox. Av.						
Total Tox. Av.						

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 8. Single Rate Plot Results

Chemical	2-(4-chlorobenzylmercapto)-4,6-dimethyl pyrimidine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			60	90	50	90
B-ft trefoil			60	70	80	90
Buckwheat			40	80	50	70
Cabbage			20	50	60	80
Castorbeans			40	70	50	90
Corn	0	0	20	40	50	70
Cotton	0	0	30	60	40	60
Cowpeas			40	70	70	90
Cucumber	10	20	50	70	70	90
Flax			30	40	40	70
Lespedeza			70	95	60	90
Lima beans			50	60	70	80
Oats			20	70	30	50
Peanuts			20	40	60	90
Peas			20	30	60	90
Red clover			60	80	80	90
Safflower			10	20	40	60
Snapbeans			40	60	80	90
Sorghum			10	30	40	60
Soybeans	0	0	30	50	40	60
Squash			10	40	70	90
Sudan grass			10	30	30	50
Sugar beets			40	70	40	70
White clover			90	95	90	100
Crop Tox. Av.	3	5	36	59	56	78
Weeds						
Crabgrass			20	50	0	0
Ryegrass			20	50	0	10
Other grasses			20	60	0	10
Pigweed			70	90	50	80
Rape			10	30	60	80
Other brdlf.			70	90	70	90
Weed Tox. Av.			35	62	30	45
Total Tox. Av.	3	5	36	59	51	72

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 9. Single Rate Plot Results

Chemical	2-(3,4-dichlorobenzylmercapto)-4,6-dimethyl pyrimidine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			20	60	40	60
B-ft trefoil			30	70	90	95
Buckwheat			20	60	70	90
Cabbage			10	30	70	80
Castorbeans			10	30	100	100
Corn	0	0	30	50	40	50
Cotton	0	0	20	30	50	90
Cowpeas			10	50	95	95
Cucumber	0	10	10	20	95	100
Flax			0	10	40	50
Lespedeza			80	100	50	70
Lima beans			10	20	60	80
Oats			30	70	20	40
Peanuts			0	10	60	70
Peas			10	30	70	90
Red clover			30	70	90	95
Safflower			0	10	60	70
Snapbeans			30	60	90	95
Sorghum			10	20	30	50
Soybeans	0	0	30	60	90	95
Squash			10	20	70	90
Sudan grass			20	40	30	50
Sugar beets			10	20	40	50
White clover			80	100	90	95
Crop Tox. Av.	0	3	20	41	62	76
Weeds						
Crabgrass			10	30	0	0
Ryegrass			20	60	0	10
Other grasses			10	30	0	10
Pigweed			80	90	90	95
Rape			10	20	40	60
Other brdlf.			80	85	90	95
Weed Tox. Av.			35	53	37	45
Total Tox. Av.	0	3	23	44	57	70

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 10. Single Rate Plot Results

Chemical	2-chloro-4-ethoxyethylamino-6-isopropylamino-s-triazine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	2W	4W	2W	4W	2W	4W
Crops [2]						
Alfalfa			95	100	100	100
B-ft trefoil			100	100	100	100
Buckwheat			40	95	100	100
Cabbage			70	100	100	100
Castorbeans			60	100	100	100
Corn	20	30	40	60	50	70
Cotton	90	95	40	60	70	90
Cowpeas			40	80	100	100
Cucumber	95	100	100	100	100	100
Flax			60	95	95	100
Lespedeza			100	100	90	100
Lima beans			40	70	95	100
Oats			50	95	80	90
Peanuts			40	60	40	60
Peas			30	60	100	100
Red clover			100	100	100	100
Safflower			30	70	100	100
Snapbeans			50	90	80	90
Sorghum			20	50	60	70
Soybeans	0	10	40	70	60	80
Squash			40	100	100	100
Sudan grass			20	40	10	30
Sugar beets			100	100	100	100
White clover			100	100	100	100
Crop Tox. Av.	26	59	59	83	85	91
Weeds						
Crabgrass			50	80	60	80
Ryegrass			100	100	80	90
Other grasses			40	70	4	60
Pigweed			100	100	95	100
Rape			60	95	80	95
Other brdlf.			95	95	95	100
Weed Tox. Av.			74	90	75	88
Total Tox. Av.	26	59	62	85	83	90

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 11. Single Rate Plot Results

Chemical	2-chloro-4,6-bis(ethylamino)-s-triazine [simazine]					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	2W	4W	2W	4W	2W	4W
Crops [2]						
Alfalfa			100	100	100	100
B-ft trefoil			100	100	100	100
Buckwheat			70	95	95	100
Cabbage			100	100	100	100
Castorbeans			100	100	100	100
Corn	20	30	10	10	0	10
Cotton	50	70	60	95	40	50
Cowpeas			70	80	100	100
Cucumber	100	100	100	100	100	100
Flax			80	95	80	90
Lespedeza			100	100	90	95
Lima beans			40	40	90	95
Oats			90	90	40	60
Peanuts			60	90	50	70
Peas			40	60	100	100
Red clover			100	100	100	100
Safflower			90	100	100	100
Snapbeans			90	95	95	100
Sorghum			20	50	40	60
Soybeans	10	30	90	95	95	95
Squash			95	100	100	100
Sudan grass			20	40	10	20
Sugar beets			100	100	100	100
White clover			100	100	100	100
Crop Tox. Av.	45	58	76	85	80	89
Weeds						
Crabgrass			95	100	80	90
Ryegrass			100	100	90	95
Other grasses			90	95	30	60
Pigweed			100	100	90	95
Rape			100	100	90	95
Other brdlf.			100	100	90	95
Weed Tox. Av.			98	99	78	88
Total Tox. Av.	45	58	80	88	80	89

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 12. Single Rate Plot Results

Chemical	2-ethoxyethylamino-4-isopropylamino-6-methoxy-s-triazine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	2W	4W	2W	4W	2W	4W
Crops [2]						
Alfalfa			30	60	100	100
B-ft trefoil			60	90	100	100
Buckwheat			0	10	100	100
Cabbage			60	90	100	100
Castorbeans			10	30	100	100
Corn	0	0	30	90	60	90
Cotton	0	0	10	20	100	100
Cowpeas			10	30	100	100
Cucumber	0	0	95	100	100	100
Flax			40	60	100	100
Lespedeza			40	80	100	100
Lima beans			20	50	90	95
Oats			30	50	50	90
Peanuts			40	60	70	90
Peas			20	40	100	100
Red clover			60	90	100	100
Safflower			10	30	100	100
Snapbeans			30	60	100	100
Sorghum			20	40	70	95
Soybeans	0	0	30	50	100	100
Squash			10	30	100	100
Sudan grass			20	50	40	60
Sugar beets			95	100	100	100
White clover			95	100	100	100
Crop Tox. Av.	0	0	36	59	91	97
Weeds						
Crabgrass			50	80	60	90
Ryegrass			40	90	90	95
Other grasses			50	80	60	90
Pigweed			60	90	100	100
Rape			50	90	90	95
Other brdlf.			60	90	100	100
Weed Tox. Av.			52	87	85	96
Total Tox. Av.	0	0	39	64	90	97

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 13. Single Rate Plot Results

Chemical	2-ethyl-4-ethylamino-6-isopropylamino-s-triazine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	2W	4W	2W	4W	2W	4W
Crops [2]						
Alfalfa			20	40	100	100
B-ft trefoil			95	100	100	100
Buckwheat			0	0	40	70
Cabbage			10	30	90	95
Castorbeans			0	0	70	90
Corn	0	0	20	30	10	20
Cotton	0	0	40	70	70	90
Cowpeas			0	0	95	100
Cucumber	0	0	60	90	100	100
Flax			20	40	80	95
Lespedeza			20	40	50	80
Lima beans			20	40	60	90
Oats			10	20	40	60
Peanuts			0	00	60	80
Peas			0	20	100	100
Red clover			95	100	100	100
Safflower			20	40	90	95
Snapbeans			10	20	90	95
Sorghum			0	20	60	80
Soybeans	0	0	20	40	90	95
Squash			0	20	100	100
Sudan grass			0	20	30	50
Sugar beets			60	95	100	100
White clover			95	100	100	100
Crop Tox. Av.	0	0	26	42	76	87
Weeds						
Crabgrass			20	60	40	60
Ryegrass			10	50	90	95
Other grasses			20	60	40	60
Pigweed			20	60	90	95
Rape			10	20	70	95
Other brdlf.			20	50	70	90
Weed Tox. Av.			17	50	67	83
Total Tox. Av.	0	0	24	43	74	86

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 14. Single Rate Plot Results

Chemical	2-isopropylamino-4-methoxyethylamino-6-methylmercapto-s-triazine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	2W	4W	2W	4W	2W	4W
Crops [2]						
Alfalfa			30	60	100	100
B-ft trefoil			100	100	100	100
Buckwheat			0	10	100	100
Cabbage			29	90	100	100
Castorbeans			30	80	100	100
Corn	0	0	30	50	100	100
Cotton	0	0	40	60	100	100
Cowpeas			20	40	90	95
Cucumber	0	0	100	100	100	100
Flax			20	50	95	100
Lespedeza			90	95	100	100
Lima beans			20	50	100	100
Oats			30	60	90	95
Peanuts			0	20	90	95
Peas			20	60	100	100
Red clover			100	100	100	100
Safflower			20	40	100	100
Snapbeans			20	50	100	100
Sorghum			30	50	100	100
Soybeans	0	0	20	40	100	100
Squash			20	40	100	100
Sudan grass			30	50	90	95
Sugar beets			100	100	100	100
White clover			100	100	100	100
Crop Tox. Av.	0	0	41	62	98	99
Weeds						
Crabgrass			60	95	90	95
Ryegrass			50	90	95	100
Other grasses			50	90	90	95
Pigweed			95	100	100	100
Rape			20	70	100	100
Other brdlf.			90	95	100	100
Weed Tox. Av.			61	90	96	98
Total Tox. Av.	0	0	45	68	98	99

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 15. Single Rate Plot Results

Chemical	n-cyclooctyl dimethylurea					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			100	100	100	100
B-ft trefoil			100	100	100	100
Buckwheat			95	100	100	100
Cabbage			100	100	100	100
Castorbeans			100	100	100	100
Corn	50	90	40	50	80	95
Cotton	95	100	40	95	90	95
Cowpeas			90	95	95	95
Cucumber	100	100	100	100	100	100
Flax			90	95	90	95
Lespedeza			100	100	100	100
Lima beans			40	95	90	95
Oats			95	100	80	90
Peanuts			80	100	60	80
Peas			60	95	100	100
Red clover			100	100	100	100
Safflower			95	95	100	100
Snapbeans			60	95	90	95
Sorghum			90	95	70	95
Soybeans	40	90	90	100	100	100
Squash			100	100	100	100
Sudan grass			80	95	70	80
Sugar beets			40	100	95	100
White clover			100	100	100	100
Crop Tox. Av.	71	95	83	96	92	97
Weeds						
Crabgrass			95	100	80	95
Ryegrass			100	100	95	100
Other grasses			95	100	70	90
Pigweed			100	100	95	100
Rape			100	100	100	100
Other brdlf.			95	100	95	100
Weed Tox. Av.			98	100	89	98
Total Tox. Av.	71	95	86	96	92	97

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 16. Single Rate Plot Results

Chemical	n-cyclooctyl dimethylurea + butynyl N-(3-chlorophenyl)carbamate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa			100	100	100	100
B-ft trefoil			100	100	100	100
Buckwheat			100	100	100	100
Cabbage			100	100	100	100
Castorbeans			100	100	100	100
Corn	50	80	40	70	60	90
Cotton	50	80	70	95	100	100
Cowpeas			60	80	95	100
Cucumber	100	100	100	100	100	100
Flax			90	95	95	100
Lespedeza			100	100	100	100
Lima beans			30	90	90	95
Oats			90	95	70	95
Peanuts			70	95	80	90
Peas			40	70	100	100
Red clover			100	100	100	100
Safflower			95	100	95	100
Snapbeans			60	90	95	100
Sorghum			60	80	80	95
Soybeans	20	40	70	95	100	100
Squash			100	100	100	100
Sudan grass			60	80	70	90
Sugar beets			30	90	100	100
White clover			100	100	100	100
Crop Tox. Av.	55	75	78	93	93	98
Weeds						
Crabgrass			100	100	90	95
Ryegrass			100	100	95	100
Other grasses			95	95	60	80
Pigweed			100	100	100	100
Rape			100	100	100	100
Other brdlf.			100	100	95	100
Weed Tox. Av.			99	99	90	96
Total Tox. Av.	55	75	82	94	92	98

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 17. Single Rate Plot Results

Chemical	N-(p-chlorophenyl)-O-N',N'-trimethylisourea					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			90	95	90	95
B-ft trefoil			100	100	95	100
Buckwheat			10	60	100	100
Cabbage			80	100	100	100
Castorbeans			60	95	100	100
Corn	40	70	0	10	40	90
Cotton	20	30	10	40	40	60
Cowpeas			10	50	95	100
Cucumber	100	100	95	100	100	100
Flax			20	40	70	90
Lespedeza			100	100	100	100
Lima beans			10	20	90	95
Oats			60	70	40	60
Peanuts			10	30	60	90
Peas			30	50	100	100
Red clover			100	100	95	100
Safflower			10	20	80	90
Snapbeans			10	40	90	95
Sorghum			60	90	60	90
Soybeans	10	20	10	30	95	100
Squash			60	80	100	100
Sudan grass			40	70	40	60
Sugar beets			95	100	100	100
White clover			100	100	100	100
Crop Tox. Av.	43	55	49	66	83	94
Weeds						
Crabgrass			95	100	60	80
Ryegrass			100	100	90	95
Other grasses			95	100	30	50
Pigweed			100	100	95	100
Rape			80	95	80	90
Other brdlf.			100	100	95	100
Weed Tox. Av.			95	99	75	86
Total Tox. Av.	43	55	58	73	81	92

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 18. Single Rate Plot Results

Chemical	1-[5-(3a,4,5,6,7,7a-hexahydro-4,7-methanoindanyl)] -3,3-dimethylurea					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			100	100	100	100
B-ft trefoil			100	100	100	100
Buckwheat			95	100	100	100
Cabbage			100	100	100	100
Castorbeans			100	100	100	100
Corn	95	95	50	60	50	80
Cotton	90	95	70	90	70	80
Cowpeas			80	80	100	100
Cucumber	100	100	100	100	100	100
Flax			90	95	100	100
Lespedeza			100	100	100	100
Lima beans			70	95	95	100
Oats			95	95	90	95
Peanuts			90	95	60	90
Peas			40	80	100	100
Red clover			100	100	100	100
Safflower			100	100	100	100
Snapbeans			90	95	95	100
Sorghum			40	70	90	95
Soybeans	40	60	90	100	100	100
Squash			100	100	100	100
Sudan grass			40	80	60	80
Sugar beets			100	100	100	100
White clover			100	100	100	100
Crop Tox. Av.	81	88	85	93	92	97
Weeds						
Crabgrass			100	100	95	100
Ryegrass			100	100	100	100
Other grasses			90	95	90	95
Pigweed			100	100	100	100
Rape			100	100	100	100
Other brdlf.			100	100	100	100
Weed Tox. Av.			98	99	98	99
Total Tox. Av.	81	88	88	94	93	97

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 19. Single Rate Plot Results

Chemical	acetate of phenylcarbamate of dimethylaminomethyl -2-naphthol					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa			100	100	95	100
B-ft trefoil			100	100	100	100
Buckwheat			40	70	95	100
Cabbage			90	100	90	95
Castorbeans			60	90	100	100
Corn	30	50	10	20	10	20
Cotton	10	30	60	80	50	70
Cowpeas			40	70	95	95
Cucumber	0	30	100	100	100	100
Flax			30	70	90	95
Lespedeza			100	100	100	100
Lima beans			30	50	90	90
Oats			60	90	20	40
Peanuts			50	90	40	60
Peas			30	70	90	95
Red clover			100	100	100	100
Safflower			20	50	90	95
Snapbeans			30	70	90	95
Sorghum			30	60	40	70
Soybeans	0	0	30	60	80	95
Squash			40	70	100	100
Sudan grass			30	60	0	10
Sugar beets			80	100	90	95
White clover			100	100	100	100
Crop Tox. Av.	10	28	57	78	77	84
Weeds						
Crabgrass			80	95	80	95
Ryegrass			80	95	80	95
Other grasses			80	95	70	90
Pigweed			100	100	90	95
Rape			90	95	80	90
Other brdlf.			80	95	95	100
Weed Tox. Av.			85	96	83	94
Total Tox. Av.	10	28	62	82	78	86

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 20. Single Rate Plot Results

Chemical	copper methane arsonate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa	Inactive	Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive
B-ft trefoil						
Buckwheat						
Cabbage						
Castorbeans						
Corn						
Cotton						
Cowpeas						
Cucumber						
Flax						
Lespedeza						
Lima beans						
Oats						
Peanuts						
Peas						
Red clover						
Safflower						
Snapbeans						
Sorghum						
Soybeans						
Squash						
Sudan grass						
Sugar beets						
White clover						
Crop Tox. Av.						
Weeds						
Crabgrass	Inactive	Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive
Ryegrass						
Other grasses						
Pigweed						
Rape						
Other brdlf.						
Weed Tox. Av.						
Total Tox. Av.						

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 21. Single Rate Plot Results

Chemical	silver methane arsonate					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa	Inactive	Inactive	Relatively Inactive	Relatively Inactive	20	30
B-ft trefoil					90	90
Buckwheat					90	95
Cabbage					95	100
Castorbeans					100	100
Corn					100	100
Cotton					60	80
Cowpeas					95	100
Cucumber					70	90
Flax					95	100
Lespedeza					60	80
Lima beans					95	100
Oats					95	100
Peanuts					90	95
Peas					90	100
Red clover					90	95
Safflower					50	80
Snapbeans					100	100
Sorghum					100	100
Soybeans					90	95
Squash					90	95
Sudan grass					100	100
Sugar beets					50	70
White clover					70	90
Crop Tox. Av.					83	91
Weeds						
Crabgrass	Inactive	Inactive	Relatively Inactive	Relatively Inactive	50	80
Ryegrass					0	10
Other grasses					40	60
Pigweed					60	80
Rape					90	95
Other brdlf.					70	80
Weed Tox. Av.					52	68
Total Tox. Av.					77	86

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 22. Single Rate Plot Results

Chemical	dodecyl hexamethylene imine					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa	Inactive	Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive
B-ft trefoil						
Buckwheat						
Cabbage						
Castorbeans						
Corn						
Cotton						
Cowpeas						
Cucumber						
Flax						
Lespedeza						
Lima beans						
Oats						
Peanuts						
Peas						
Red clover						
Safflower						
Snapbeans						
Sorghum						
Soybeans						
Squash						
Sudan grass						
Sugar beets						
White clover						
Crop Tox. Av.						
Weeds						
Crabgrass	Inactive	Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive	Relatively Inactive
Ryegrass						
Other grasses						
Pigweed						
Rape						
Other brdlf.						
Weed Tox. Av.						
Total Tox. Av.						

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 23. Single Rate Plot Results

Chemical	N-(2-chloro-4-nitrophenyl)-methane sulfonamide					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4A	8A	4A	8A	4A	8A
Crops [2]						
Alfalfa			20	70	60	80
B-ft trefoil			30	60	90	95
Buckwheat			0	20	40	60
Cabbage			10	20	60	80
Castorbeans			20	60	50	95
Corn	0	0	30	50	30	70
Cotton	0	0	30	60	40	60
Cowpeas			20	50	60	90
Cucumber	20	30	20	50	50	80
Flax			30	70	80	90
Lespedeza			30	70	60	80
Lima beans			20	70	30	40
Oats			10	30	10	20
Peanuts			10	20	30	60
Peas			0	40	50	70
Red clover			30	60	90	95
Safflower			20	50	60	80
Snapbeans			30	50	50	70
Sorghum			0	0	20	40
Soybeans	0	0	20	40	40	60
Squash			30	50	40	70
Sudan grass			20	40	20	40
Sugar beets			70	90	40	60
White clover			90	95	90	100
Crop Tox. Av.	5	8	25	51	50	70
Weeds						
Crabgrass			20	30	0	10
Ryegrass			20	30	0	10
Other grasses			60	85	0	10
Pigweed			60	90	70	90
Rape			0	10	50	70
Other brdlf.			60	90	40	70
Weed Tox. Av.			37	56	27	43
Total Tox. Av.	5	8	27	52	45	65

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 24. Single Rate Plot Results

Chemical	3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa			70	95	60	80
B-ft trefoil			95	100	40	70
Buckwheat			100	100	50	70
Cabbage			10	50	10	20
Castorbeans			40	70	90	95
Corn	0	0	10	30	50	70
Cotton	0	0	60	80	90	95
Cowpeas			40	60	70	90
Cucumber	0	0	95	100	90	95
Flax			40	80	40	60
Lespedeza			70	95	70	90
Lima beans			30	50	60	80
Oats			90	95	0	10
Peanuts			10	30	40	60
Peas			20	40	50	70
Red clover			95	100	40	70
Safflower			40	80	40	60
Snapbeans			30	50	70	90
Sorghum			20	50	50	80
Soybeans	0	0	20	40	50	70
Squash			90	95	70	90
Sudan grass			30	60	40	60
Sugar beets			30	70	40	60
White clover			95	100	70	90
Crop Tox. Av.	0	0	51	72	53	72
Weeds						
Crabgrass			60	90	10	10
Ryegrass			10	40	10	20
Other grasses			60	90	10	10
Pigweed			95	100	50	70
Rape			10	40	10	20
Other brdlf.			95	95	40	60
Weed Tox. Av.			55	76	21	30
Total Tox. Av.	0	0	52	73	47	64

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 25. Single Rate Plot Results

Chemical	4,6-dinitro-o-sec-butylphenol [DNBP], alkanolamine salt					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	4W	8W	4W	8W	4W	8W
Crops [2]						
Alfalfa			95	100	100	100
B-ft trefoil			100	100	100	100
Buckwheat			100	100	100	100
Cabbage			100	100	100	100
Castorbeans			60	90	100	100
Corn	0	0	20	30	60	90
Cotton	0	0	80	95	100	100
Cowpeas			40	70	95	100
Cucumber	0	0	30	50	100	100
Flax			90	95	100	100
Lespedeza			60	95	100	100
Lima beans			30	60	70	95
Oats			95	100	100	100
Peanuts			20	50	40	70
Peas			20	40	60	90
Red clover			100	100	100	100
Safflower			100	100	100	100
Snapbeans			30	50	95	100
Sorghum			50	70	70	90
Soybeans	0	0	30	50	95	100
Squash			60	80	100	100
Sudan grass			50	70	70	90
Sugar beets			100	100	100	100
White clover			100	100	100	100
Crop Tox. Av.	0	0	65	79	90	97
Weeds						
Crabgrass			90	95	90	95
Ryegrass			90	95	95	100
Other grasses			90	95	70	90
Pigweed			95	100	100	100
Rape			100	100	100	100
Other brdlf.			90	95	100	100
Weed Tox. Av.			93	97	76	98
Total Tox. Av.	0	0	71	83	87	97

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 26. Single Rate Plot Results

Chemical	2,4-dichlorophenoxyacetic acid [2,4-D], alkanolamine salt					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A [1]	1W	2W	1W	2W	1W	2W
Crops [2]						
Alfalfa			90	95	100	100
B-ft trefoil			95	100	100	100
Buckwheat			30	70	100	100
Cabbage			100	100	100	100
Castorbeans			40	70	100	100
Corn	0	0	50	70	30	50
Cotton	0	0	95	95	100	100
Cowpeas			40	70	100	100
Cucumber	0	0	70	95	100	100
Flax			40	70	95	100
Lespedeza			95	100	100	100
Lima beans			40	60	100	100
Oats			60	60	40	60
Peanuts			30	60	40	60
Peas			20	50	100	100
Red clover			95	100	100	100
Safflower			90	95	100	100
Snapbeans			40	70	100	100
Sorghum			70	95	40	70
Soybeans	0	0	40	60	100	100
Squash			50	70	100	100
Sudan grass			40	70	40	60
Sugar beets			95	100	100	100
White clover			95	100	100	100
Crop Tox. Av.	0	0	63	80	87	92
Weeds						
Crabgrass			40	70	30	60
Ryegrass			40	70	80	90
Other grasses			40	70	30	60
Pigweed			90	95	100	100
Rape			90	100	100	100
Other brdlf.			80	90	100	100
Weed Tox. Av.			63	83	73	85
Total Tox. Av.	0	0	63	81	84	90

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 27. Single Rate Plot Results

Chemical	N-(beta-O,O-diethyl dithiophosphorylethyl) benzene sulfonamide					
Application	Pre-planting		Pre-emergence		Post-emergence	
Rate lb/A 1/	4A	8A	4A	8A	4A	8A
Crops 2/						
Alfalfa			0	0		
B-ft trefoil			20	50		
Buckwheat			60	90		
Cabbage			0	0		
Castorbeans			10	40		
Corn	0	0	0	10		
Cotton	0	0	0	0		
Cowpeas			30	50		
Cucumber	10	30	0	0		
Flax			0	0		
Lespedeza			0	0		
Lima beans			0	0		
Oats			20	50		
Peanuts			0	0		
Peas			0	0		
Red clover			20	50		
Safflower			0	0		
Snapbeans			0	0		
Sorghum			0	0		
Soybeans	0	0	0	0		
Squash			30	50		
Sudan grass			20	40		
Sugar beets			0	0		
White clover			50	90		
Crop Tox. Av.	3	8	11	22	Relatively Inactive	Relatively Inactive
Weeds						
Crabgrass			0	0		
Ryegrass			0	0		
Other grasses			0	0		
Pigweed			0	80		
Rape			0	0		
Other brdlf.			0	0		
Weed Tox. Av.			0	13	Relatively Inactive	Relatively Inactive
Total Tox. Av.	3	8	9	20		

1/ A = acetone; W = water.

2/ Herbicide activity index: 0 = no effect; 100 = complete kill.

Table 28. A brief generalized summary of preliminary pre-planting data by crop and chemical for easy reference for selection of chemicals for specific crops. 1/

Chemical	Crops: Corn	Cotton	Cucumber	Soybeans	Weeds: Grasses	Broadleaf
α-carbo-(2,4-dichlorophenoxyethoxy)ethyl N-phenylcarbamate Table (1)	X	X	X	X		
α-carbo-(2,4-dichlorophenoxyethoxy)ethyl N-(3-chlorophenyl)carbamate (2)	X	X	X	X		
isopropyl N-(3-chlorophenyl)carbamate [CIPC] (3)	X	X		X		
propynyl N-phenylcarbamate (4)	X	X	X	X		
propynyl N-(3-chlorophenyl)carbamate (5)	X	X	X	X		
2,4-dichlorophenoxyethyl N-phenylcarbamate (6)	X	X	X	X		
2-benzylmercapto-4,6-dimethyl pyrimidine (7)						
2-(4-chlorobenzylmercapto)-4,6-dimethyl pyrimidine (8)	X	X	X	X		
2-(3,4-dichlorobenzylmercapto)-4,6-dimethyl pyrimidine (9)	X	X	X	X		
2-chloro-4-ethoxyethylamino-6-isopropylamino-s-triazine (10)	X			X		
2-chloro-4,6-bis(ethylamino)-s-triazine [simazine] (11)	X			X		
2-ethoxyethylamino-4-isopropylamino-6-methoxy-s-triazine (12)	X	X	X	X		
2-ethyl-4-ethylamino-6-isopropylamino-s-triazine (13)	X	X	X	X		
2-isopropylamino-4-methoxyethylamino-6-methylmercapto-s-triazine (14)	X	X	X	X		
n-cyclooctyl dimethylurea (15)						
n-cyclooctyl dimethylurea + butynyl N-(3-chlorophenyl)carbamate (16)				X		
N-(p-chlorophenyl)-O-N', N'-trimethylisourea (17)		X		X		
1-[5-(3a,4,5,6,7,7a-hexahydro-4,7-methanoindanyl)]-3,3-dimethylurea (18)						
acetate of phenylcarbamate of dimethylaminomethyl-2-naphthol (19)	X	X	X	X		
copper methane arsonate (20)						
silver methane arsonate (21)						
dodecyl hexamethylene imine (22)						
N-(2-chloro-4-nitrophenyl)-methane sulfonamide (23)	X	X	X	X		
3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione (24)	X	X	X	X		
4,6-dinitro-o-sec-butylphenol [DNBP], alkanolamine salt (25)	X	X	X	X		
2,4-dichlorophenoxyacetic acid [2,4-D], alkanolamine salt (26)	X	X	X	X		
N-(beta-O,O-diethyl dithiophosphorylethyl) benzene sulfonamide (27)	X	X	X	X		

1/ Checks are placed opposite crops that tolerated respective chemicals (Phytotoxicity index, 30 or less).
Checks are placed opposite weeds controlled by respective chemicals (Phytotoxicity index, 70 or more).

Table 29. A brief generalized summary of preliminary pre-emergence data by crop and chemical for easy reference for selection of chemicals for specific crops. 1/

Chemical	α-carbo-(2,4-dichlorophenoxy-ethoxy)ethyl N-phenylcarbamate Table (1)	α-carbo-(2,4-dichlorophenoxy-ethoxy)ethyl N-(3-chlorophenyl)-carbamate (2)	isopropyl N-(3-chlorophenyl)-carbamate [CIPC] (3)	propynyl N-phenylcarbamate (4)	propynyl N-(3-chlorophenyl)-carbamate (5)	2,4-dichlorophenoxyethyl N-phenylcarbamate (6)	2-benzylmercapto-4,6-dimethyl pyrimidine (7)	2-(4-chlorobenzylmercapto)-4,6-dimethyl pyrimidine (8)	2-(3,4-dichlorobenzylmercapto)-4,6-dimethyl pyrimidine (9)	2-chloro-4-ethoxyethylamino-6-isopropylamino-s-triazine (10)	2-chloro-4,6-bis(ethylamino)-s-triazine [simazine] (11)	2-ethoxyethylamino-4-isopropyl-amino-6-methoxy-s-triazine (12)	2-ethyl-4-ethylamino-6-isopropyl-amino-s-triazine (13)	2-isopropylamino-4-methoxyethyl-amino-6-methylmercapto-s-triazine (14)	n-cyclooctyl dimethylurea (15)
Crops															
Small Seeded Legume Crops															
Alfalfa				X	X				X			X	X	X	
B-ft. trefoil				X					X						
Lespedeza				X	X								X		
Red clover				X					X						
White clover				X											
Cereals and Forage Crops															
Buckwheat						X			X			X	X	X	
Corn			X	X	X	X		X	X		X	X	X	X	
Oats				X		X		X	X			X	X	X	
Sorghum			X	X	X	X		X	X	X	X	X	X	X	
Sudangrass			X	X	X	X		X	X	X	X	X	X	X	
Oilseed and Fiber Crops															
Castorbeans	X		X	X	X	X			X			X	X	X	
Cotton				X	X			X	X			X			
Flax				X		X		X	X				X	X	
Peanuts	X	X	X	X	X			X	X				X	X	
Safflower			X	X	X	X		X	X	X		X	X	X	
Soybeans			X	X	X	X		X	X			X	X	X	
Sugar Crops															
Sugar beets				X					X						
Vegetable Crops															
Cabbage				X	X	X		X	X				X	X	
Cowpeas			X	X	X				X			X	X	X	
Cucumber				X	X	X			X						
Lima beans		X	X	X	X	X			X			X	X	X	
Peas	X		X	X	X	X		X	X	X		X	X	X	
Snapbeans			X	X	X	X			X			X	X	X	
Squash				X	X			X	X			X	X	X	
Weeds															
Grasses	X	X	X							X	X	X		X	X
Broadleaf	X	X	X			X		X	X	X	X	X		X	X

1/ Checks are placed opposite crops that tolerated respective chemicals (Phytotoxicity index, 30 or less).
Checks are placed opposite weeds controlled by respective chemicals (Phytotoxicity index, 70 or more).

Table 29. Continued.

	Chemical	n-cyclooctyl dimethylurea + butynyl N-(3-chlorophenyl)carbamate (16)	N-(p-chlorophenyl)-O-N',N'-trimethylisourea (17)	1-[5-(3a,4,5,6,7,7a-hexahydro-4,7-methanoindanyl)]-3,3-dimethylurea (18)	acetate of phenylcarbamate of dimethylaminomethyl-2-naphthol (19)	copper methane arsonate (20)	silver methane arsonate (21)	dodecyl hexamethylene imine (22)	N-(2-chloro-4-nitrophenyl)-methane sulfonamide (23)	3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione (24)	4,6-dinitro-o-sec-butylphenol [DNBP], alkanolamine salt (25)	2,4-dichlorophenoxyacetic acid [2,4-D], alkanolamine salt (26)	N-(beta-O,O-diethyl dithiophosphorylethyl) benzene sulfonamide (27)			
	Crops															
Small Seeded Legume Crops	Alfalfa								X				X			
	B-ft. trefoil								X				X			
	Lespedeza								X				X			
	Red clover								X				X			
	White clover															
Cereals and Forage Crops	Buckwheat		X						X			X				
	Corn		X		X				X	X	X		X			
	Oats								X				X			
	Sorghum				X				X	X			X			
	Sudangrass				X				X	X			X			
Oilseed and Fiber Crops	Castorbeans								X				X			
	Cotton		X						X				X			
	Flax		X		X				X				X			
	Peanuts		X						X	X	X	X	X			
	Safflower		X		X				X				X			
	Soybeans		X		X				X	X	X		X			
Sugar Crops	Sugar beets	X								X			X			
Vegetable Crops	Cabbage								X	X			X			
	Cowpeas		X						X				X			
	Cucumber								X		X		X			
	Lima beans	X	X		X				X	X	X		X			
	Peas		X		X				X	X	X	X	X			
	Snapbeans		X		X				X	X	X		X			
	Squash								X				X			
	Weeds															
	Grasses	X	X	X	X				X	X	X	X				
	Broadleaf	X	X	X	X				X	X	X	X	X			

1/ Checks are placed opposite crops that tolerated respective chemicals (Phytotoxicity index, 30 or less).
Checks are placed opposite weeds controlled by respective chemicals (Phytotoxicity index, 70 or more).

Table 30. A brief generalized summary of preliminary post-emergence data by crop and chemical for easy reference for selection of chemicals for specific crops. 1/

	Chemical	α-carbo-(2,4-dichlorophenoxy-ethoxy)ethyl N-phenylcarbamate Table (1)	α-carbo-(2,4-dichlorophenoxy-ethoxy)ethyl N-(3-chlorophenyl)-carbamate (2)	isopropyl N-(3-chlorophenyl)-carbamate [CIPC] (3)	propynyl N-phenylcarbamate (4)	propynyl N-(3-chlorophenyl)-carbamate (5)	2,4-dichlorophenoxyethyl N -phenylcarbamate (6)	2-benzylmercapto-4,6-dimethyl pyrimidine (7)	2-(4-chlorobenzylmercapto)-4,6 -dimethyl pyrimidine (8)	2-(3,4-dichlorobenzylmercapto) -4,6-dimethyl pyrimidine (9)	2-chloro-4-ethoxyethylamino-6 -isopropylamino-s-triazine (10)	2-chloro-4,6-bis(ethylamino)-s -triazine [simazine] (11)	2-ethoxyethylamino-4-isopropyl-amino-6-methoxy-s-triazine (12)	2-ethyl-4-ethylamino-6-isopropyl-amino-s-triazine (13)	2-isopropylamino-4-methoxyethyl-amino-6-methylmercapto-s -triazine (14)	n-cyclooctyl dimethylurea (15)
	Crops															
Small Seeded Legume Crops	Alfalfa															
	B-ft. trefoil															
	Lespedeza															
	Red clover															
	White clover															
Cereals and Forage Crops	Buckwheat															
	Corn					X						X		X		
	Oats		X						X	X						
	Sorghum	X	X							X						
	Sudangrass	X	X	X					X	X	X	X		X		
Oilseed and Fiber Crops	Castorbeans					X										
	Cotton															
	Flax	X														
	Peanuts					X										
	Safflower			X												
	Soybeans															
Sugar Crops	Sugar beets															
Vegetable Crops	Cabbage					X										
	Cowpeas															
	Cucumber															
	Lima beans			X												
	Peas															
	Snapbeans															
	Squash															
	Weeds															
	Grasses			X		X					X	X	X	X	X	X
	Broadleaf	X	X	X		X			X	X	X	X	X	X	X	X

1/ Checks are placed opposite crops that tolerated respective chemicals (Phytotoxicity index, 30 or less).
Checks are placed opposite weeds controlled by respective chemicals (Phytotoxicity index, 70 or more).

Table 30. Continued.

Chemical		n-cyclooctyl dimethylurea + butynyl N-(3-chlorophenyl)carbamate (16)	N-(p-chlorophenyl)-O-N',N'-trimethylisourea (17)	1-[5-(3a,4,5,6,7,7a-hexahydro-4,7-methanoindanyl)]-3,3-dimethylurea (18)	acetate of phenylcarbamate of dimethylaminomethyl-2-naphthol (19)	copper methane arsonate (20)	silver methane arsonate (21)	dodecyl hexamethylene imine (22)	N-(2-chloro-4-nitrophenyl)-methane sulfonamide (23)	3-(p-chlorophenyl)-5-ethyl-2,4-oxazolidine dione (24)	4,6-dinitro-o-sec-butylphenol [DNBP], alkanolamine salt (25)	2,4-dichlorophenoxyacetic acid [2,4-D], alkanolamine salt (26)	N-(beta-O,O-diethyl dithiophosphorylethyl) benzene sulfonamide (27)			
	Crops															
Small Seeded Legume Crops	Alfalfa						X									
	B-ft. trefoil															
	Lespedeza															
	Red clover															
	White clover															
Cereals and Forage Crops	Buckwheat															
	Corn				X				X			X				
	Oats				X				X	X						
	Sorghum								X							
	Sudangrass				X				X							
Oilseed and Fiber Crops	Castorbeans															
	Cotton															
	Flax															
	Peanuts								X							
	Safflower															
	Soybeans															
Sugar Crops	Sugar beets															
Vegetable Crops	Cabbage									X						
	Cowpeas															
	Cucumber															
	Lima beans								X							
	Peas															
	Snapbeans															
	Squash															
	Weeds															
	Grasses	X	X	X	X		X				X	X				
	Broadleaf	X	X	X	X		X		X	X	X	X				

1/ Checks are placed opposite crops that tolerated respective chemicals (Phytotoxicity index, 30 or less).
Checks are placed opposite weeds controlled by respective chemicals (Phytotoxicity index, 70 or more).

Table 31. Logarithmic Rate Plot Results, Tables 31-33.

Chemical	3-(3,4-dichlorophenyl)-1-methoxy -1-methylurea		tributyl isooctenylphosphonium chloride		methyl N-(3,4-dichlorophenyl)-carbamate		4,6-dinitro-2-sec-butylphenol acetate		N,N-dimethyl-2,2-diphenyl-acetamide, formulated		N,N-di - n-propyl - 2,6-dinitro-p -toluidine		2,6-dinitro-N,N-di-n-propyl-α,α,α-trifluoro-p-toluidine	
Rate Range lb/A	0.5 to 4.0		1.0 to 8.0		1.0 to 8.0		1.0 to 8.0		1.0 to 8.0		1.0 to 8.0		1.0 to 8.0	
Time of Appl.	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e
Crop (Max. rate tolerated lb/A)														
Alfalfa	0.0 *	0.0	No effect	0.0	1.0	0.0	1.0	0.0	8.0	1.0	8.0	1.0	2.0	2.0
B-ft trefoil	0.0	0.0		0.0	0.0	1.0	1.0	0.0	0.0	1.0	4.0	2.0	1.0	1.0
Buckwheat	0.0	0.0		0.0	1.0	0.0	0.0	0.0	4.0	1.0	4.0	1.0	3.0	2.0
Cabbage	0.0	0.0		0.0	1.0	0.0	0.0	0.0	6.0	2.0	8.0	2.0	6.0	6.0
Corn, Field	2.0	0.0		0.0	6.0	1.0	6.0	1.0	8.0	1.0	8.0	4.0	8.0	3.0
Corn, Sweet	1.0	0.0		0.0	4.0	1.0	6.0	1.0	8.0	1.0	8.0	4.0	8.0	3.0
Cotton	0.5	0.0		0.0	6.0	1.0	8.0	0.0	8.0	2.0	8.0	1.0	6.0	2.0
Flax	0.5	0.0		0.0	1.0	0.0	4.0	2.0	8.0	4.0	8.0	4.0	6.0	0.0
Lima beans	0.5	0.0		0.0	6.0	0.0	4.0	0.0	8.0	2.0	8.0	1.0	8.0	0.0
Oats	1.0	0.0		0.0	2.0	1.0	2.0	1.0	4.0	0.0	6.0	6.0	4.0	6.0
Onions	0.0	0.0		2.0	2.0	1.0	0.0	1.0	4.0	1.0	8.0	6.0	1.0	6.0
Peanuts	0.5	0.0		0.0	4.0	1.0	8.0	1.0	8.0	8.0	8.0	1.0	6.0	2.0
Peas	0.0	0.0		0.0	1.0	1.0	8.0	0.0	8.0	1.0	8.0	1.0	8.0	0.0
Red clover	0.0	0.0		0.0	1.0	1.0	1.0	0.0	1.0	1.0	4.0	3.0	1.0	1.0
Safflower	1.0	0.5		0.0	2.0	---	0.0	---	8.0	---	8.0	---	8.0	8.0
Snapbeans	0.5	0.0		0.0	6.0	0.0	8.0	0.0	8.0	1.0	8.0	1.0	8.0	0.0
Soybeans	1.0	0.0		0.0	3.0	1.0	6.0	0.0	8.0	1.0	8.0	1.0	3.0	0.0
Squash	0.0	0.0		0.0	1.0	0.0	3.0	0.0	8.0	2.0	8.0	1.0	3.0	2.0
Sudan grass	1.0	0.0		0.0	4.0	1.0	4.0	0.0	8.0	1.0	8.0	2.0	2.0	4.0
Sugar beets	0.0	0.0		0.0	1.0	0.0	0.0	0.0	8.0	4.0	8.0	1.0	2.0	1.0
Tomatoes	0.0	0.0		0.0	1.0	0.0	0.0	0.0	8.0	2.0	4.0	1.0	2.0	0.0
Turnips	0.0	0.0		0.0	0.0	1.0	0.0	0.0	8.0	1.0	8.0	2.0	4.0	4.0
Weeds (Min. rate required for control lb/A)														
Crabgrass	0.5	1.0	No effect	nc **	1.0	nc	nc	nc	nc	nc	nc	nc	2.0	nc
Pigweed	0.5	nc		nc	0.5	6.0	4.0	nc	1.0	nc	nc	nc	2.0	nc
Rape	0.5	0.5		nc	0.5	nc	1.0	2.0	nc	nc	nc	nc	nc	nc
Ryegrass	1.0	4.0		nc	4.0	nc	4.0	nc	4.0	nc	nc	nc	4.0	nc

* 0 = no crop tolerance in rate range indicated.
** nc = no weed control in rate range indicated.

Table 32. Logarithmic Rate Plot Results.

Chemical	N,N-di-n-propyl-2,6-dinitroaniline		N,N-dimethyl-2,2-diphenylacetamide, technical		2-methoxy-4,6-bis(3-methoxypropylamino)-s-triazine		2,4-bis(isopropylamino)-6-methylmercapto-s-triazine		2-chloro-4-ethylamino-6-diethylamino-s-triazine		methyl-o-nitrophenylsulfide		ethyl-di-n-butylthiolcarbamate		t-butyl-di-n-propylthiolcarbamate	
Rate Range lb/A	1.0 to 8.0		1.0 to 8.0		0.5 to 4.0		0.5 to 4.0		0.5 to 4.0		1.0 to 8.0		1.0 to 8.0		1.0 to 8.0	
Time of Appl.	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e
Crop (Max. rate tolerated lb/A)																
Alfalfa	8.0	2.0	8.0		4.0	1.0	1.0	0.0 *	0.0	0.5	8.0	1.0	8.0	1.0		
B-ft trefoil	6.0	3.0	1.0		3.0	0.0	0.0	0.0	0.0	0.0	8.0	1.0	8.0	1.0		
Buckwheat	8.0	2.0	4.0		0.0	0.0	1.0	0.0	1.0	0.0	8.0	2.0	8.0	1.0		
Cabbage	6.0	0.0	8.0		2.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	8.0	0.0		
Corn, Field	8.0	0.0	8.0		4.0	2.0	4.0	0.0	4.0	2.0	8.0	1.0	8.0	1.0		
Corn, Sweet	8.0	0.0	8.0		3.0	2.0	4.0	0.0	4.0	2.0	8.0	1.0	8.0	1.0		
Cotton	8.0	0.0	6.0		4.0	0.0	4.0	1.0	3.0	0.5	8.0	0.0	8.0	1.0		
Flax	6.0	4.0	6.0		2.0	2.0	2.0	0.5	1.0	0.5	8.0	1.0	8.0	1.0		
Lima beans	6.0	4.0	8.0		4.0	0.0	2.0	0.0	2.0	0.0	8.0	0.0	8.0	2.0		
Oats	8.0	6.0	6.0		4.0	1.0	4.0	0.0	1.0	0.5	0.0	1.0	8.0	1.0		
Onions	6.0	8.0	6.0		3.0	1.0	0.0	0.0	1.0	0.0	8.0	0.0	8.0	0.0		
Peanuts	8.0	0.0	6.0		4.0	1.0	2.0	0.5	1.0	0.5	8.0	4.0	8.0	2.0		
Peas	8.0	2.0	8.0		4.0	0.0	1.0	0.0	0.0	0.0	8.0	0.0	8.0	1.0		
Red clover	8.0	3.0	1.0		3.0	0.0	0.0	0.0	0.0	0.0	8.0	1.0	8.0	1.0		
Safflower	6.0	6.0	8.0		4.0	4.0	0.0	0.0	0.0	0.5	8.0	0.0	8.0	4.0		
Snapbeans	8.0	0.0	8.0		4.0	0.0	1.0	0.0	0.0	0.0	8.0	0.0	8.0	2.0		
Soybeans	8.0	0.0	8.0		2.0	0.0	0.5	0.0	3.0	0.0	8.0	3.0	8.0	1.0		
Squash	6.0	0.0	6.0		1.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	8.0	0.0		
Sudan grass	8.0	2.0	8.0		3.0	1.0	4.0	0.0	4.0	1.0	8.0	1.0	8.0	1.0		
Sugar beets	8.0	0.0	6.0		4.0	0.0	1.0	0.0	0.0	0.0	8.0	4.0	8.0	2.0		
Tomatoes	6.0	0.0	8.0		1.0	1.0	0.0	0.0	0.0	0.5	8.0	1.0	8.0	1.0		
Turnips	6.0	0.0	8.0		4.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	6.0	1.0		
Crop				No effect											No effect	No effect
Weeds (Min. rate required for control lb/A)																
Crabgrass	nc **	nc	nc		nc	nc	2.0	3.0	nc	nc	nc	nc	nc	nc		
Pigweed	6.0	nc	8.0		3.0	4.0	1.0	0.5	0.5	nc	nc	nc	nc	nc		
Rape	nc	nc	nc		nc	nc	1.0	3.0	2.0	nc	nc	nc	nc	nc		
Ryegrass	nc	nc	4.0		nc	nc	nc	3.0	3.0	nc	nc	nc	nc	nc		
Weeds				No effect											No effect	No effect

* 0 = no crop tolerance in rate range indicated.
** nc = no weed control in rate range indicated.

Table 33. Logarithmic Rate Plot Results.

Chemical	3-(3,4-dichlorophenyl)-1,1-dimethylurea [diuron]		4,6-dinitro-o-sec-butylphenol [DNBP], alkanolamine salts		isopropyl N-(3-chloropheny')carbamate [CIPC]		2,4-dichlorophenoxyacetic acid [2,4-D], alkanolamine salts		1,2-dihydropyridazine-3,6-dione (maleic hydrazide) [MH]		2,6-dichlorobenzonitrile	
Rate Range lb/A	0.5 to 4.0		1.0 to 8.0		1.0 to 8.0		0.5 to 4.0		0.5 to 4.0		0.5 to 4.0	
Time of Appl.	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e	Pre-e	Post-e
Crop (Max. rate tolerated lb/A)												
Alfalfa	0.5	0.0 *	2.0	0.0	4.0	0.0	1.0	0.0	No effect	0.5	0.0	0.0
B-ft trefoil	0.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0		0.5	0.0	0.0
Buckwheat	0.0	0.0	0.0	0.0	0.0	1.0	2.0	0.0		1.0	1.0	0.5
Cabbage	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0		1.0	0.5	0.5
Corn, Field	2.0	0.0	8.0	0.0	8.0	1.0	4.0	3.0		2.0	4.0	4.0
Corn, Sweet	2.0	0.0	4.0	0.0	8.0	1.0	4.0	3.0		2.0	4.0	4.0
Cotton	2.0	0.5	2.0	0.0	6.0	0.0	0.0	0.0		2.0	3.0	1.0
Flax	1.0	1.0	4.0	0.0	0.0	0.0	4.0	0.0		4.0	1.0	0.5
Lima beans	0.0	0.0	6.0	0.0	8.0	1.0	0.0	0.0		0.0	3.0	0.5
Oats	0.0	0.5	3.0	0.0	1.0	1.0	4.0	3.0		0.5	1.0	1.0
Onions	0.5	0.0	0.0	0.0	4.0	2.0	0.0	0.0		4.0	0.5	0.5
Peanuts	0.5	0.0	8.0	1.0	6.0	0.0	0.0	0.0		1.0	3.0	1.0
Peas	0.0	0.0	6.0	0.0	8.0	0.0	0.0	0.0		0.5	3.0	0.5
Red clover	0.0	0.0	3.0	0.0	1.0	1.0	0.0	0.0		0.5	0.0	0.0
Safflower	0.0	0.5	---	0.0	8.0	3.0	4.0	0.0		0.5	0.5	0.5
Snapbeans	0.0	0.0	6.0	0.0	8.0	0.0	0.0	0.0		4.0	3.0	0.0
Soybeans	0.0	0.0	2.0	0.0	3.0	0.0	1.0	0.0		0.5	0.5	0.5
Squash	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0		0.5	0.5	0.5
Sudan grass	2.0	0.0	4.0	0.0	8.0	0.0	4.0	3.0		0.5	4.0	4.0
Sugar beets	0.0	0.0	0.0	0.0	4.0	2.0	4.0	0.0		3.0	0.5	0.5
Tomatoes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.5	0.0	0.0
Turnips	0.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0		0.0	0.5	0.0
Weeds (Min. rate required for control lb/A)												
Crabgrass	1.5	nc **	8.0	nc	6.0	nc	nc	nc	No effect	nc	nc	nc
Pigweed	0.5	1.0	4.0	1.0	6.0	nc	2.0	1.0		nc	1.0	nc
Rape	1.0	4.0	1.0	1.0	4.0	nc	nc	1.0		nc	3.0	nc
Ryegrass	1.0	1.0	6.0	nc	6.0	nc	nc	nc		nc	1.0	nc

* 0 = no crop tolerance in rate range indicated.
** nc = no weed control in rate range indicated.